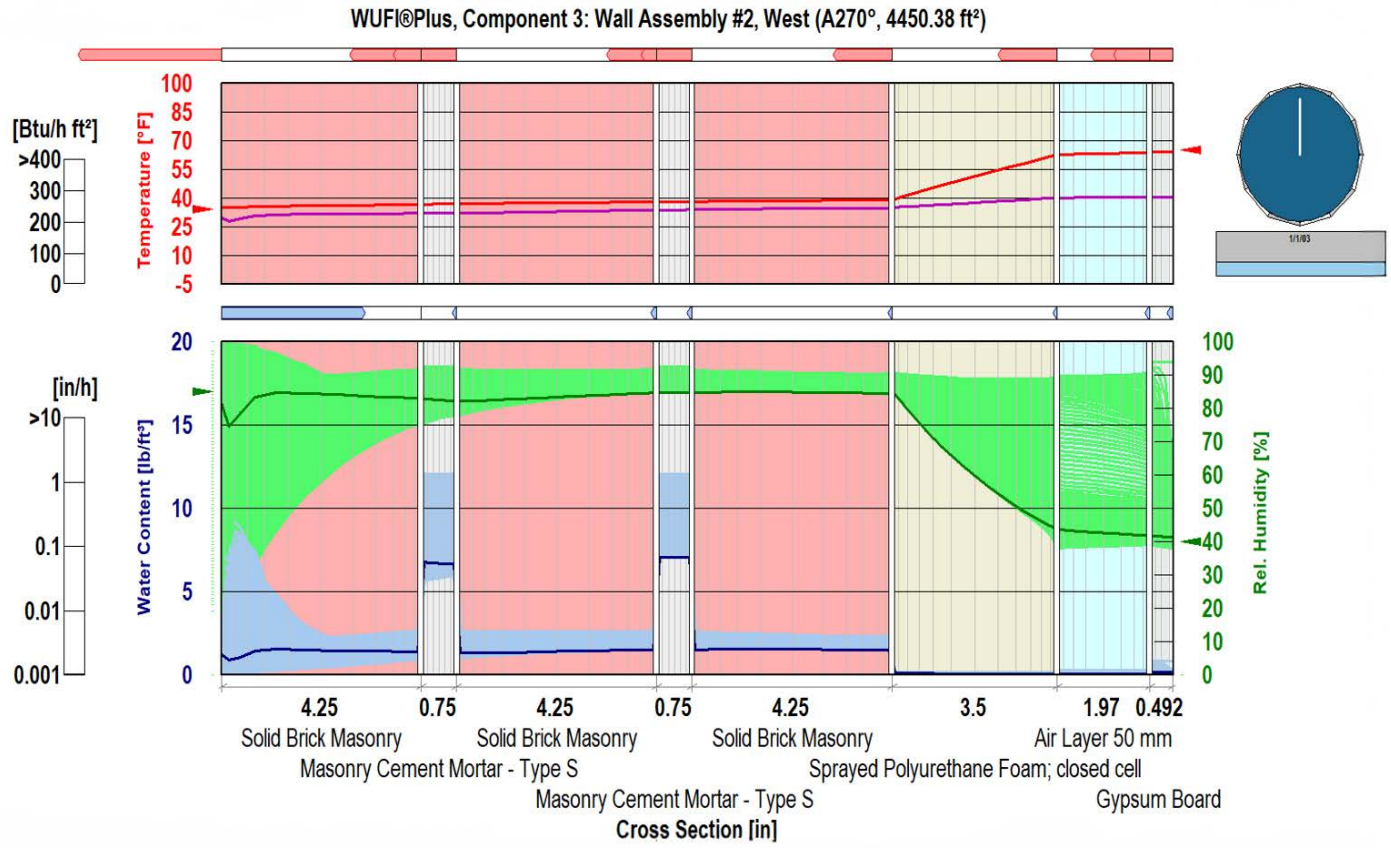


Hygrothermal Analysis Services

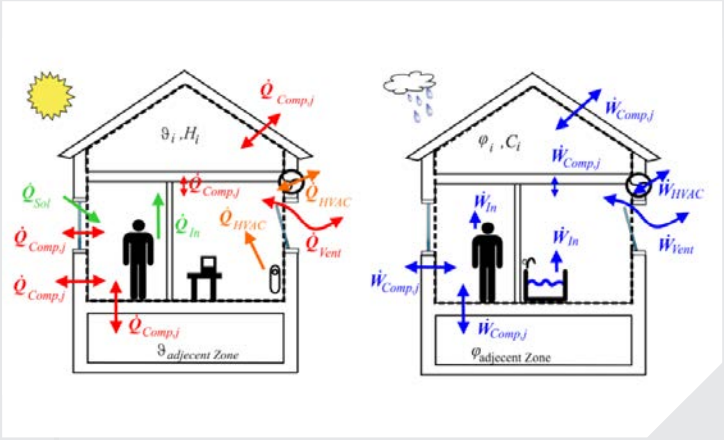
Predicting Heat & Moisture Performance for Durable Building Enclosures

SK&A®

Hygrothermal Analysis Services

What is Hygrothermal Analysis?

Hygrothermal analysis is the evaluation of heat transfer, air movement, and moisture transport through building enclosure assemblies over time. Unlike prescriptive code checks or simplified dew-point calculations, hygrothermal modeling accounts for real climate conditions, material properties, and transient behavior to predict how wall and roof assemblies actually perform in service. This analysis is essential for:

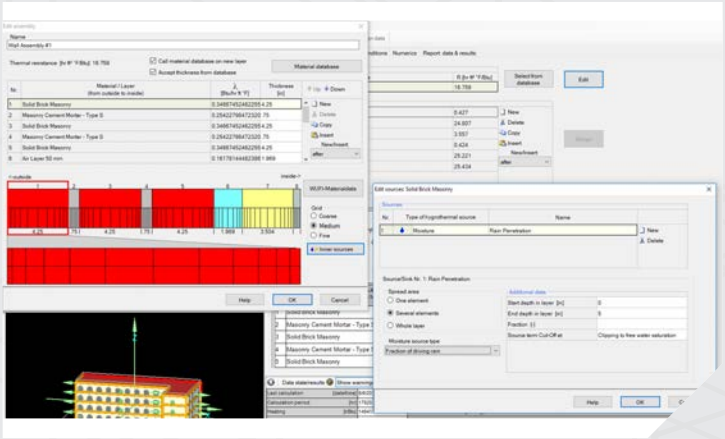


- Preventing condensation, moisture accumulation, and mold growth.
- Evaluate drying potential and long-term durability.
- Supporting design decisions for high-performance, retrofit, and complex enclosure assemblies.

WUFI Software Overview

SK&A utilizes WUFI the industry-leading hygrothermal simulation platform developed by Fraunhofer IBP and widely adopted by building enclosure consultants worldwide. WUFI capabilities include:

- Transient (time-dependent) simulation of heat and moisture transport.
- Analysis of vapor diffusion, liquid transport, capillary action, and sorption.
- Evaluation of condensation risk, interstitial moisture, and drying rates.
- Material-specific inputs based on validated laboratory data.
- Modeling of both new construction and existing assemblies.



WUFI allows enclosure performance to be evaluated over multiple years—capturing seasonal and operational effects that simplified methods cannot.

Hygrothermal Analysis Services

How SK&A Uses Hygrothermal Analysis

SK&A integrates WUFI modeling with our building enclosure expertise to provide actionable, design-relevant insights—not just raw simulation output. Our approach includes:

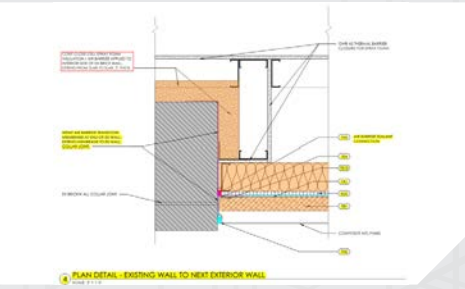
- Developing assembly-specific models reflecting actual materials, thicknesses, and boundary conditions.
- Applying project-specific climate data and exposure assumptions.
- Interpreting results through the lens of constructability, service life, and risk management.
- Translating complex results into clear recommendations for design teams and owners.
- Evaluation of mold growth & corrosion potential per ASHRAE Standard 160.

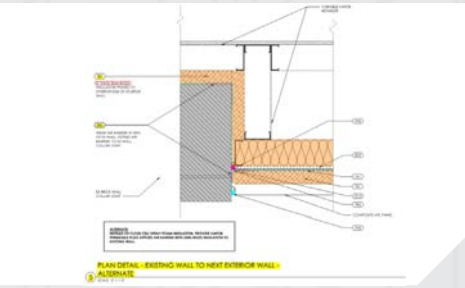
Comparative Analysis for Proposed Assemblies

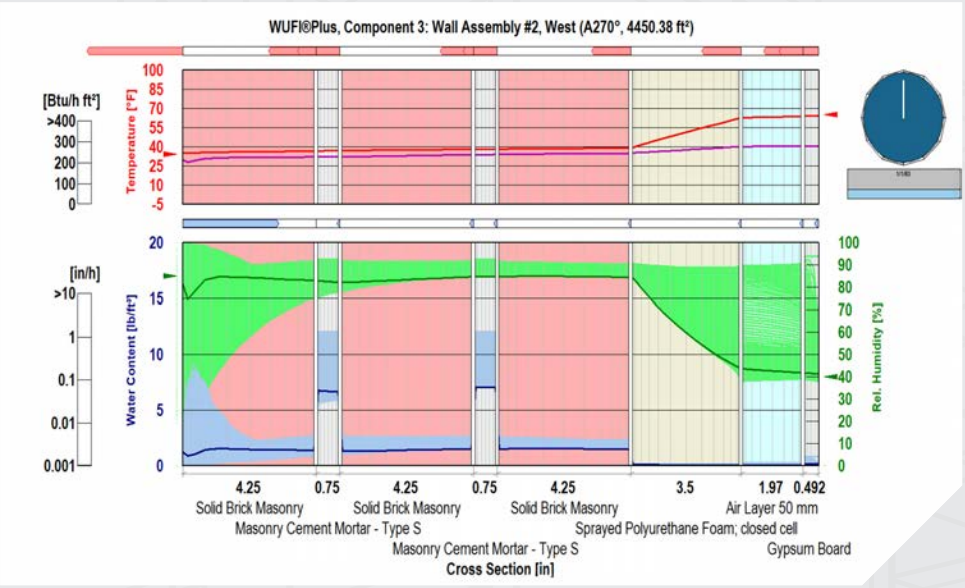
For new construction and renovations, SK&A frequently uses hygrothermal analysis to compare multiple enclosure options side-by-side. Typical applications include:

- Evaluating alternate insulation types, vapor retarders, or air barrier strategies.
- Assessing impacts of interior humidity, ventilation systems, or occupancy load changes.
- Identifying assemblies with improved drying potential and reduced moisture risk.
- Supporting design decisions for high-performance, net-zero, or adaptive reuse projects.

This comparative modeling allows teams to make data-driven enclosure decisions early—before issues are built into the project.





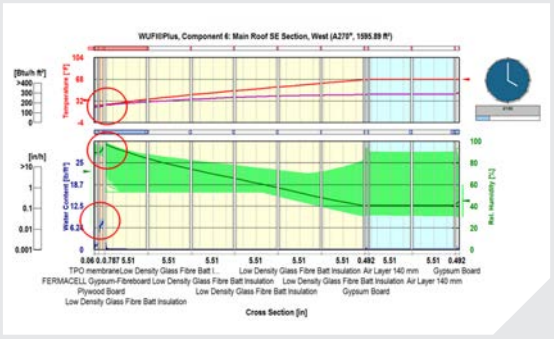


Hygrothermal Analysis Services

Validation & Forensic Investigations

SK&A also applies hygrothermal modeling to existing buildings as part of forensic investigations and failure assessments. In these cases, WUFI is used to:

- Validate whether observed distress is consistent with modeled moisture behavior.
- Test hypotheses related to condensation, vapor drive reversal, or insufficient drying.
- Evaluate the role of construction sequencing, material substitutions, or operational conditions.
- Support repair strategies by modeling post-repair performance.



When combined with field observations, intrusive testing, and laboratory data, hygrothermal analysis becomes a powerful tool for root-cause determination and defensible remediation design.

Why SK&A?

SK&A's hygrothermal analysis services are distinguished by the integration of:

- Advanced simulation tools.
- Hands-on enclosure investigation experience.
- Practical building science knowledge.
- Clear, client-focused communication.
- Clear, defensible reporting that supports decision-making – not guesswork.

Collaborative Expertise.
Proven Performance.
Lasting Confidence.

Our goal is not simply to model performance—but to help clients design, diagnose, and deliver durable building enclosures with confidence.

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